IN THE CLAIMS

Please amend the claims as follows:

Claims 1-20 (cancelled)

21. (currently amended) A current sensor for measuring a time varying current flowing through a conductor, comprising:

a plurality of discrete planar insulating substrates ~~elements~~ substantially equidistant from a central cavity for receiving the conductor, said planar substrates ~~elements~~ being spaced apart from each other and aligned with angularly spaced planes that are oriented in substantially axial and radial directions relative to the axis of said cavity, and with at least one surface coil having at least one complete turn defined on a single surface of each said substrate ~~element~~, said coils being electrically interconnected such that output voltages of said coils are combined and applied to output terminals of said sensor, wherein at least a plurality of the coils on separate substrates ~~elements~~ are interconnected with each other with twisted pair wire.

22. (currently amended) A current sensor according to claim 21 wherein ~~a~~ each said surface coil comprises a conductive track on ~~a~~ the surface of ~~a~~ the substrate.

23. (currently amended) A current sensor according to claim 22 wherein at least one surface coil is provided on an opposite surface of a the substrate ~~element~~.

24. (currently amended) A current sensor according to claim 23 wherein at least two surface coils on opposite surfaces of a the substrate ~~element~~ are connected through a via.

25. (currently amended) A current sensor according to claim 22 wherein ~~a~~ each said surface coil includes a plurality of nested conductive turns, of progressively smaller size, one within another, on the surface of the substrate.

26. (previously presented) A current sensor according to claim 25 wherein the amount of substrate area occupied by a turn is very small compared to the area enclosed by said turn.

27. (currently amended) A current sensor according to claim 21 wherein the substrates ~~elements~~

are all spaced at equal angles.

28. (currently amended) A current sensor according to claim 21 wherein the substrates ~~elements~~ are uniformly spaced at unequal angles, while oriented with symmetry about the axis of the central cavity.

29. (previously presented) A current sensor according to claim 27 further comprising a housing in which the coils are disposed, the housing being divided into at least two sections, such that said sections may be spread apart, to allow entry of said conductor into said cavity.

30. (previously presented) A current sensor according to claim 28 further comprising a housing in which the coils are disposed, the housing being divided into at least two sections, such that said sections may be spread apart, to allow entry of said conductor into said cavity.

31. (previously presented) A current sensor according to claim 29, wherein the mating surfaces of the two sections are located between substrates, so as to provide a separation distance between the mating surfaces and the coil conductors.

32. (previously presented) A current sensor according to claim 30, wherein the mating surfaces of the two sections are located between substrates, so as to provide a separation distance between the mating surfaces and the coil conductors.

33. (currently amended) A current sensor for measuring a time varying current flowing through a conductor, comprising:

a plurality of planar insulating substrate elements substantially equidistant from a central cavity for receiving the conductor, said substrate elements being spaced apart from each other and aligned with angularly spaced planes that are oriented in substantially axial and radial directions relative to the axis of said cavity, and with at least one surface coil having at least one complete turn defined on a single surface of each said substrate element, said coils being electrically interconnected such that output voltages of said coils are combined and applied to output terminals of said sensor, wherein at least a plurality of the substrate elements are integral with each other, being sections of a flexible substrate strip.

34. (currently amended) A current sensor according to claim 33 wherein a each said surface coil

comprises a track on the surface of the substrate strip and electrical interconnections between the coils are defined by tracks on the substrate strip.

35. (currently amended) A current sensor according to claim 34 wherein at least one surface coil is provided on an opposite surface of a the substrate element.

36. (currently amended) A current sensor according to claim 35 wherein at least two surface coils on opposite surfaces of ~~a~~ the substrate element are connected through a via.

37. (currently amended) A current sensor according to claim 34 wherein a each said surface coil includes a plurality of nested conductive turns, of progressively smaller size, one within another, on the said surface of the substrate element.

38. (previously presented) A current sensor according to claim 37 wherein the amount of substrate area occupied by a turn is very small compared to the area enclosed by said turn.

39. (previously presented) A current sensor according to claim 33 wherein the substrate elements are all spaced at equal angles.

40. (previously presented) A current sensor according to claim 33 wherein the substrate elements are uniformly spaced at unequal angles, while oriented with symmetry about the axis of the central cavity.

41. (previously presented) A current sensor according to claim 39 further comprising a housing in which the coils are disposed, the housing being divided into at least two sections, such that said sections may be spread apart, to allow entry of said conductor into said cavity.

42. (previously presented) A current sensor according to claim 40 further comprising a housing in which the coils are disposed, the housing being divided into at least two sections, such that said sections may be spread apart, to allow entry of said conductor into said cavity.

43. (currently amended) A current sensor according to claim 41 wherein the mating surfaces of the two sections are located between substrate elements ~~sections~~, so as to provide a separation distance between the mating surfaces and the coil conductors.

44. (currently amended) A current sensor according to claim 42 wherein the mating surfaces of the two sections are located between substrate elements ~~sections~~, so as to provide a separation distance between the mating surfaces and the coil conductors.